

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Twin, Minnehaha County

LBS-Lake-204-000

2018

## Lake Information

**Name:** Twin **Maximum Depth:** 21 Feet  
**County:** Minnehaha **Mean Depth:** 11 Feet  
**Legal Description:** T105N-R52W Sec. 16-17, 20-21  
**Surface Area:** 304 Acres

## Surveys and Investigations

Survey methods used by gear type, date, and effort.

Gear	Date	Effort
AFS std gill net	May 21, 2018	6 net-nights

## **Common Fish Species Present**

Yellow Perch

Walleye

Black Bullhead

Common Carp

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## Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- **std experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

$$CPUE = \frac{\text{number of fish}}{\text{effort}}$$

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

$$PSD = \left( \frac{\text{number of fish} \geq \text{quality length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

$$PSD - P = \left( \frac{\text{number of fish} \geq \text{preferred length}}{\text{number of fish} \geq \text{stock length}} \right) \times 100$$

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (**W**) compared to a length-specific standard weight (**Ws**) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left( \frac{W}{W_s} \right) \times 100$$

Confidence intervals (CI) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (S), quality (Q), preferred (P), memorable (M) and trophy (T). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

Species Name	Stock		Quality		Preferred		Memorable		Trophy	
	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)	(in)	(cm)
Black Bullhead	6	15	9	23	12	30	15	38	18	46
Black Crappie	5	13	8	20	10	25	12	30	15	38
Bluegill	3	8	6	15	8	20	10	25	12	30
Brown Trout	8	20	12	30	16	40	20	50	18	46
Channel Catfish	11	28	16	41	24	61	28	71	36	91
Freshwater Drum	8	20	12	30	15	38	20	51	25	63
Lake Trout	12	30	20	50	26	65	31	80	39	100
Largemouth Bass	8	20	12	30	15	38	20	51	25	63
Muskellunge	20	51	30	76	38	97	42	107	50	127
Northern Pike	14	35	21	53	28	71	34	86	44	112
Pumpkinseed	3	8	6	15	8	20	10	25	12	30
Rainbow Trout	10	25	16	40	20	50	26	65	31	80
Rudd	6	15	10	25	12	30	15	38	19	48
Sauger	8	20	12	30	15	38	20	51	25	63
Smallmouth Bass	7	18	11	28	14	35	17	43	20	51
Walleye	10	25	15	38	20	51	25	63	30	76
White Bass	6	15	9	23	12	30	15	38	18	46
White Crappie	5	13	8	20	10	25	12	30	15	38
Yellow Bullhead	4	10	7	18	9	23	11	28	14	36
Yellow Perch	5	13	8	20	10	25	12	30	15	38

## **Catch Summary of Stock Length Fish**

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

**\* Methods/Species that ignore stock length**

Gear	Species	Sample Size (n)	Abundance		Stock Density Indices			Condition		
			CPUE	CI-80	PSD	CI-80	PSD-P	CI-80	Wr	CI-80
AFS std gill net	Black Bullhead	59	9.8	2.9	97		47	9		
	Common Carp	9	1.5	0.6	100		11			
	Walleye	68	10.8	1.2	88	6	35	9	93	1
	Yellow Perch	16	2.7	2.0	100		88		98	2

## 10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

Gear	Species	CPUE										Avg
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Black Bullhead									25.7	9.8	17.8
	Common Carp									1.7	1.5	1.6
	Walleye									9.3	10.8	10.1
	Yellow Perch									1.5	2.7	2.1
boat shocker (night)	Walleye					65.3						65.3
fall night EF- WAE	Walleye				21.5							21.5
frame net (std 3/4 in)	Black Bullhead			10.4	542.1	98.5						217.0
	Bluegill				1.5	0.1						0.8
	Green Sunfish			0.1	0.8	0.5						0.5
	Walleye			7.2	20.4	7.9						11.8
	Yellow Perch			11.1	3.8	0.5						5.1
std exp gill net	Black Bullhead			32.3	108.5	111.3	31.3	45.0	15.0			57.2
	Bluegill								0.3			0.3
	Common Carp						0.3					0.3
	Walleye			25.0	10.0	30.7	11.3	6.3	28.3			18.6
	Yellow Perch			24.0	63.5	4.7	29.8	53.5	33.7			34.9

## 10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

Gear	Species	Index	Year										
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
AFS std gill net	Black Bullhead	PSD										56	97
		PSD-P										55	47
	Common Carp	PSD										0	100
		PSD-P										0	11
	Walleye	PSD										88	88
		PSD-P										30	35
		Wr										94	93
	Yellow Perch	PSD										100	100
		PSD-P										78	88
Wr											96	98	
boat shocker (night)	Walleye	PSD						2					
		PSD-P						2					
		Wr						103					
fall night EF- WAE	Walleye	Wr				88							
frame net (std 3/4 in)	Black Bullhead	PSD			0	29	90						
		PSD-P			0	2	0						
		Wr			103	90	90						
	Walleye	PSD			23	52	54						
		PSD-P			0	6	6						
		Wr			84	73	84						
	Yellow Perch	PSD			71	100	80						
		PSD-P			21	74	60						
		Wr			109	98	117						
std exp gill net	Black Bullhead	PSD			18	2	94	100	100	99			
		PSD-P			3	0	1	3	70	97			
		Wr			108	97	99						
	Common Carp	PSD							0				
		PSD-P							0				
	Walleye	PSD			13	40	36	60	60	47			
		PSD-P			1	25	18	18	8	6			
		Wr			84	74	88	82	82	95			

Gear	Species	Index	Year									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
std exp gill net	Yellow Perch	PSD			94	97	86	18	99	22		
		PSD-P			38	54	79	8	5	22		
		Wr			110	100	119	111	103	104		



## Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Walleye

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2018	68	220 (3)	360 (8)	431 (5)	465 (22)	499 (5)		534 (3)	564 (2)	542 (14)	602 (7)
2017	57	235 (1)	364 (6)	406 (18)	411 (2)		472 (4)	484 (3)	521 (14)	551 (7)	557 (2)
2016	169	283 (19)	359 (79)	402 (14)		448 (9)	472 (6)	480 (29)	508 (12)		505 (6)
2015	40	191 (15)	297 (8)	378 (1)	394 (3)	425 (1)	419 (7)	441 (3)	558 (1)		638 (1)
2014	50	237 (7)	271 (1)	355 (11)	399 (3)	397 (16)	501 (5)	533 (1)	563 (3)	595 (2)	660 (1)
2013	97	189 (4)	294 (50)	347 (5)	385 (14)	481 (7)	536 (1)	535 (11)	555 (4)	543 (1)	
2012	55	218 (35)	310 (5)	358 (9)	475 (1)		544 (3)	541 (2)			
2011	112	248 (22)	324 (78)	407 (8)	480 (2)	487 (2)					

Species: Yellow Perch

Mean Length (expanded sample number) at capture by age											
Year	N	1	2	3	4	5	6	7	8	9	10+
2015	214		228 (212)		298 (2)						
2014	119	161 (96)	261 (1)	228 (16)	294 (3)	333 (3)					
2013	14	171 (2)		274 (7)	283 (5)						
2012	127	185 (4)	248 (101)	265 (23)							

## **Fish Condition**

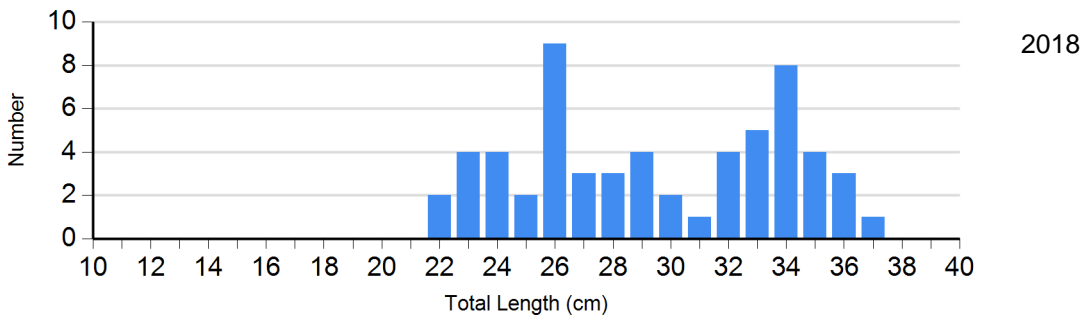
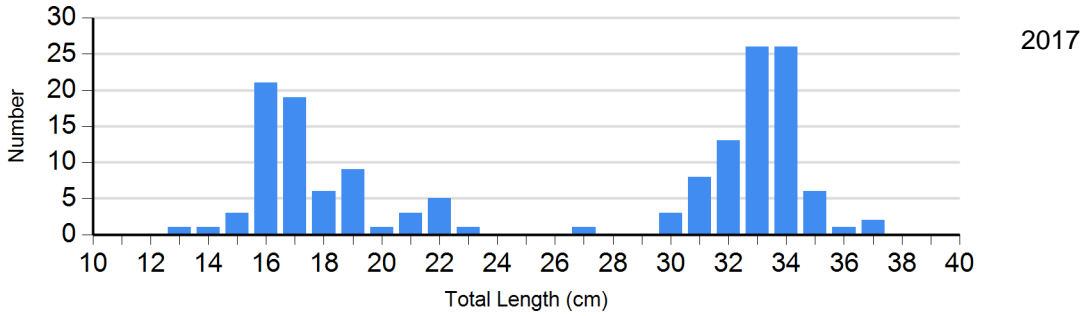
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

Species	Year	Length Groups							
		S-Q		Q-P		P-M		M	
		N	Wr (SE)	N	Wr (SE)	N	Wr (SE)	N	Wr (SE)
Walleye Gill Net	2014	18	86 (2.2)	19	83 (1.6)	7	70 (1.4)	1	57
	2015	10	86 (2.5)	13	79 (1.6)	1	78	1	68
	2016	90	95 (0.6)	69	94 (1.0)	10	90 (2.1)	1	
	2017	7	92 (1.3)	32	94 (1.0)	17	95 (1.5)	0	
	2018	8	102 (1.9)	34	93 (1.0)	23	90 (1.5)	0	
Yellow Perch Gill Net	2014	97	110 (1.2)	13	116 (2.6)	5	107 (4.8)	4	109 (1.3)
	2015	2	97	201	103 (0.7)	11	100 (1.6)	0	
	2016	157	103 (0.7)	1		26	109 (1.6)	18	102 (2.6)
	2017	0		2	89 (9.9)	0		7	98 (1.7)
	2018	0		2	99 (2.0)	4	97 (1.8)	10	98 (1.9)

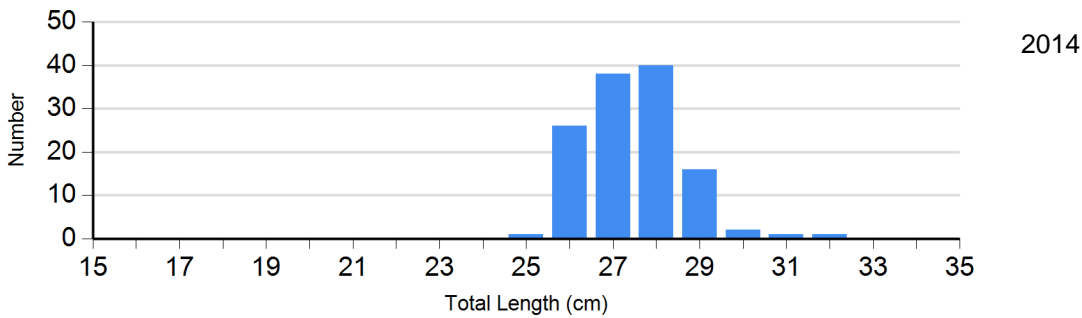
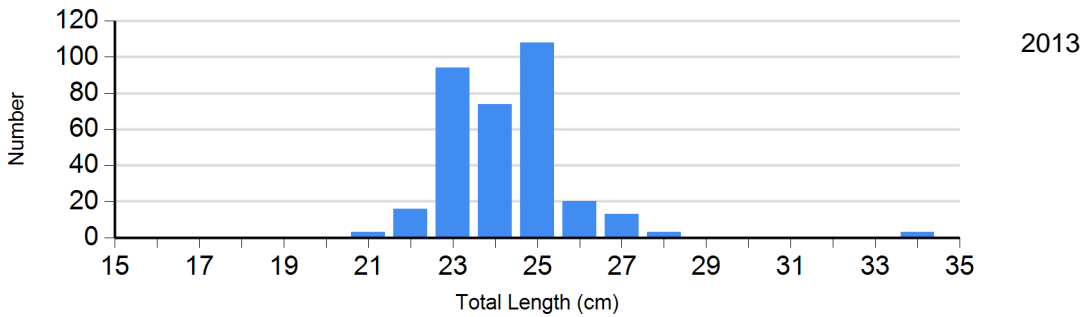
# Length Frequency Distribution

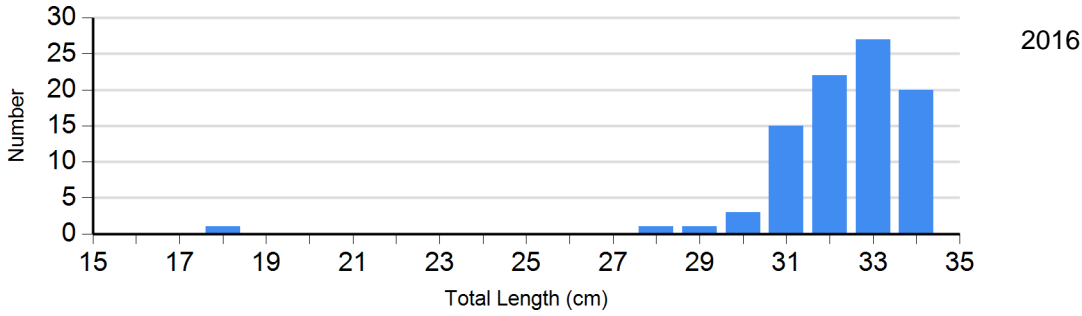
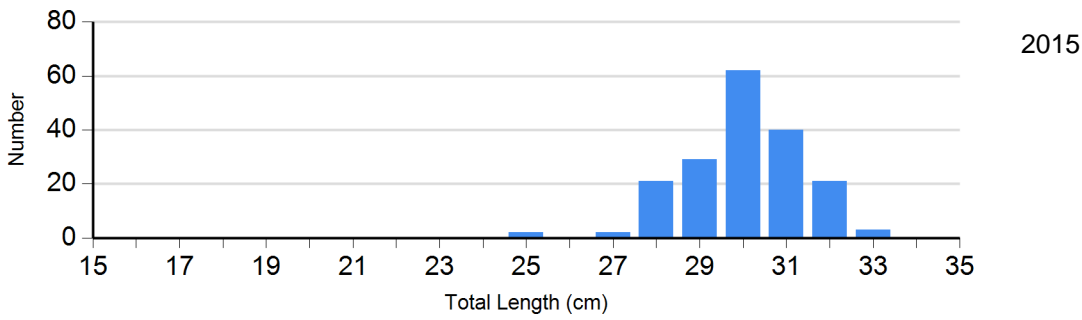
Length frequency histogram of species sampled by year.

Species: Black Bullhead  
Gear: AFS std gill net

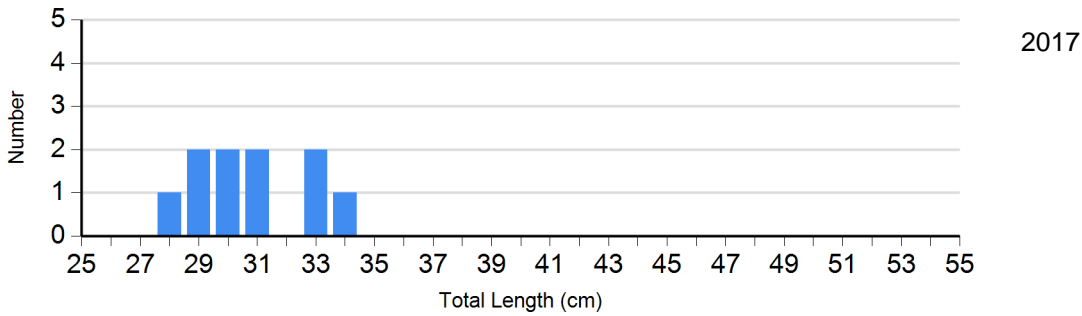


Species: Black Bullhead  
Gear: std exp gill net

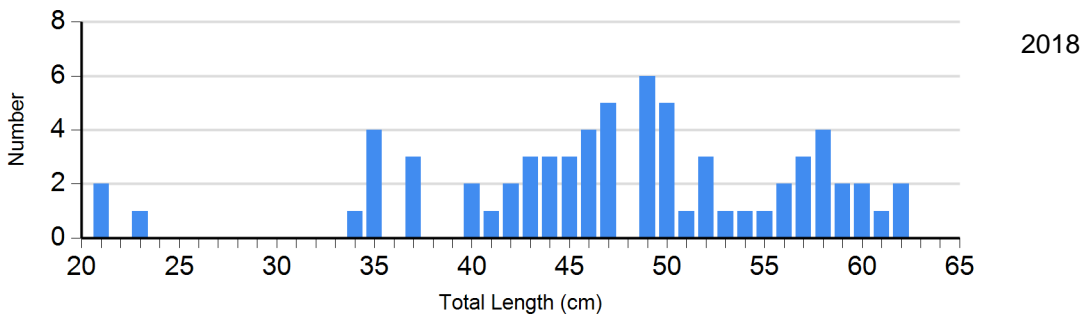
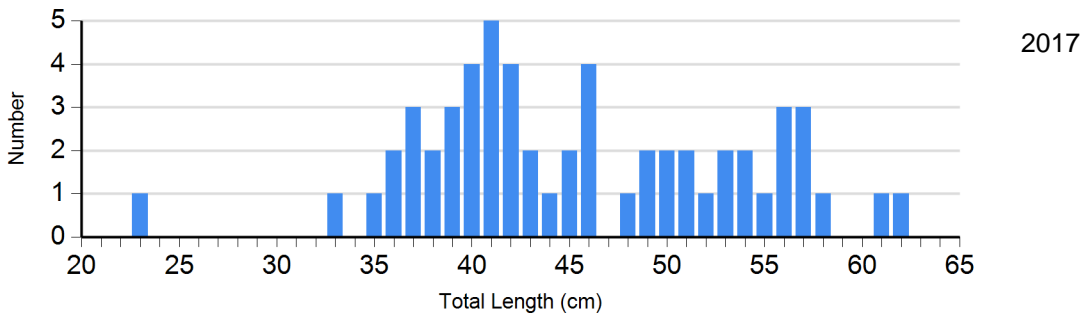




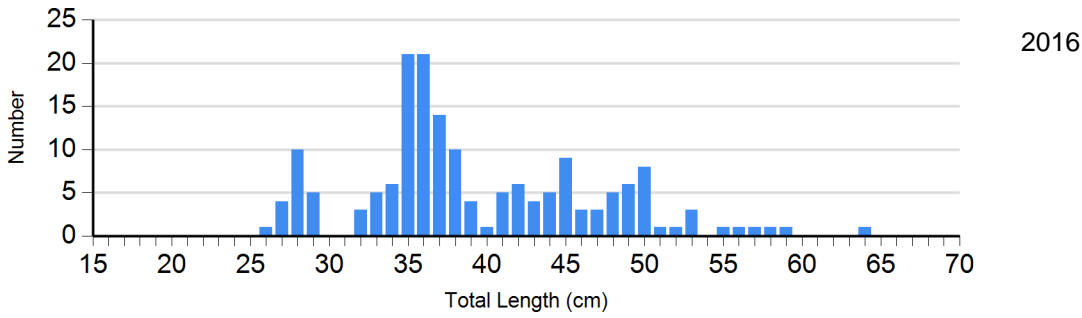
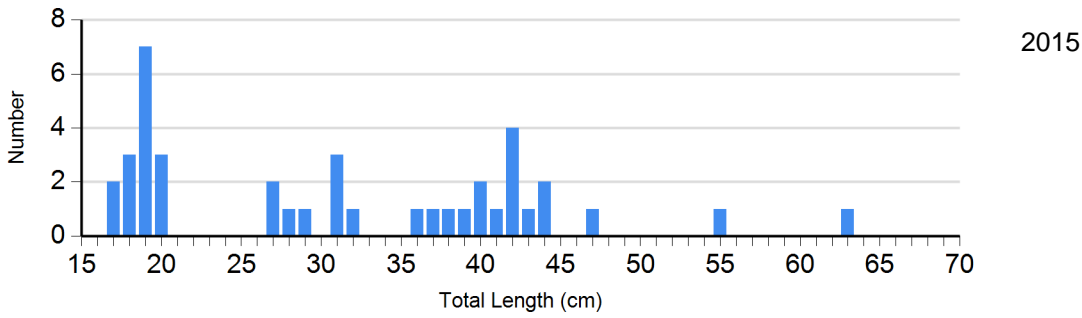
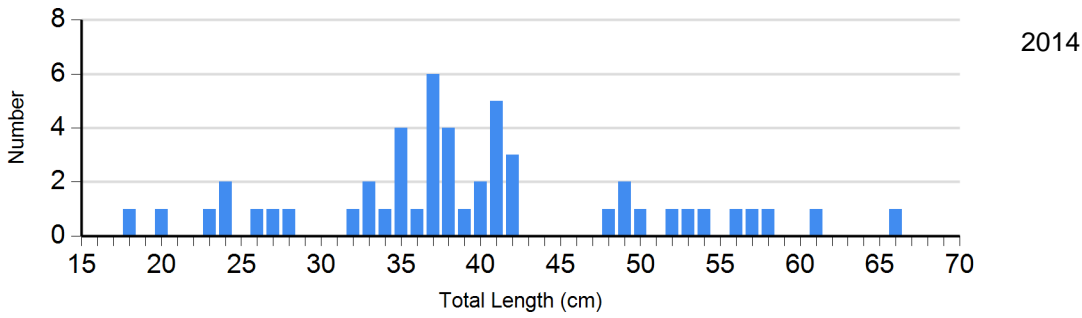
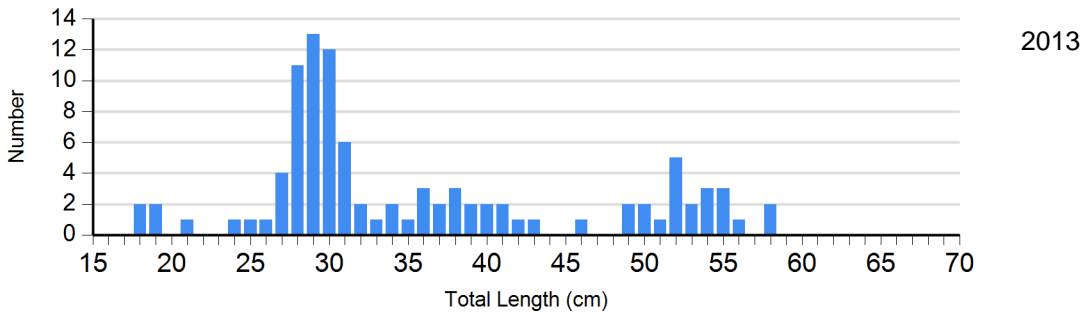
Species: Common Carp  
Gear: AFS std gill net



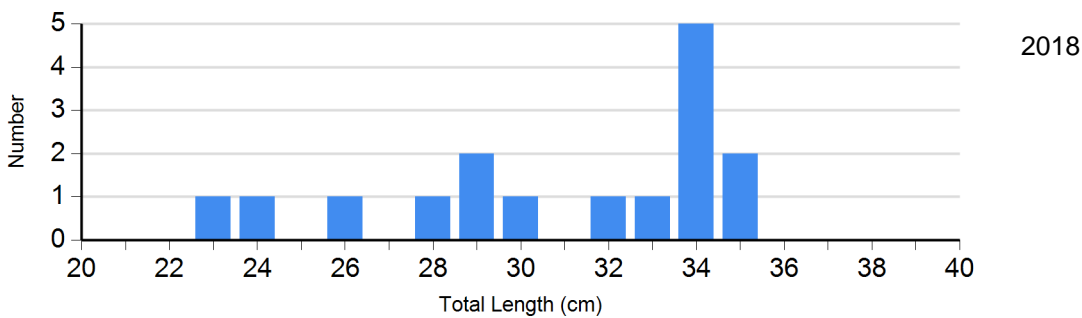
Species: Walleye  
Gear: AFS std gill net



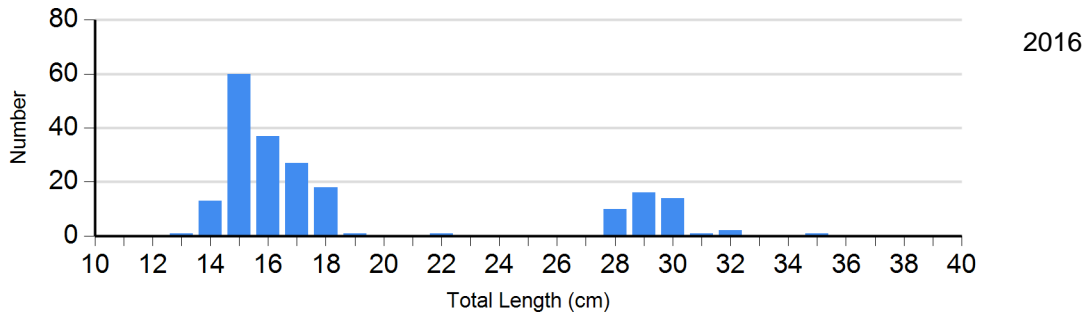
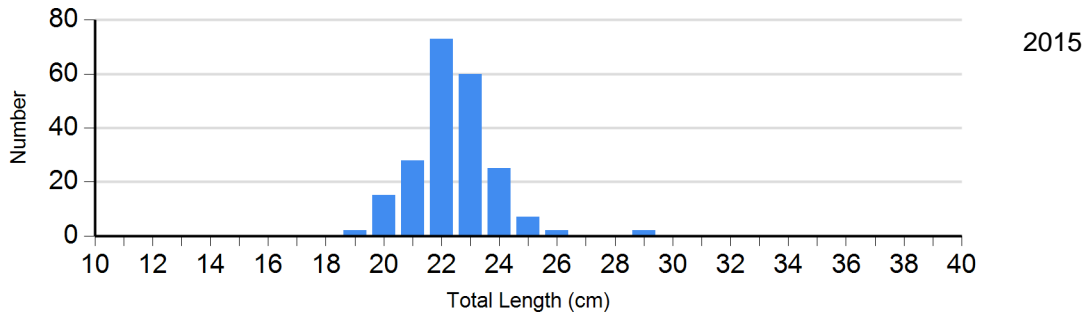
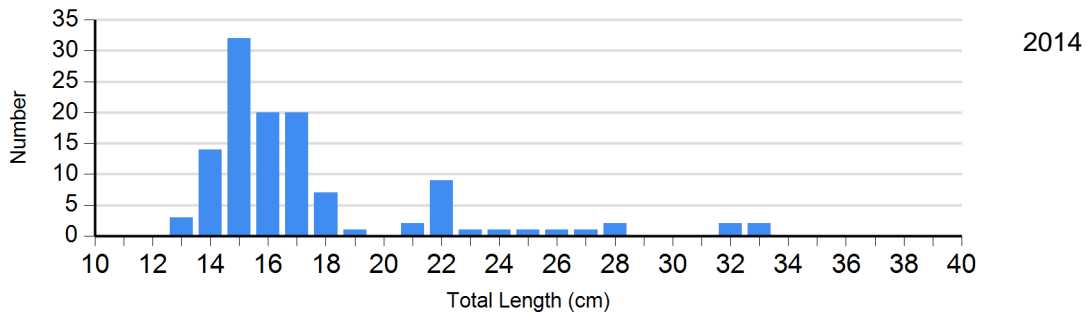
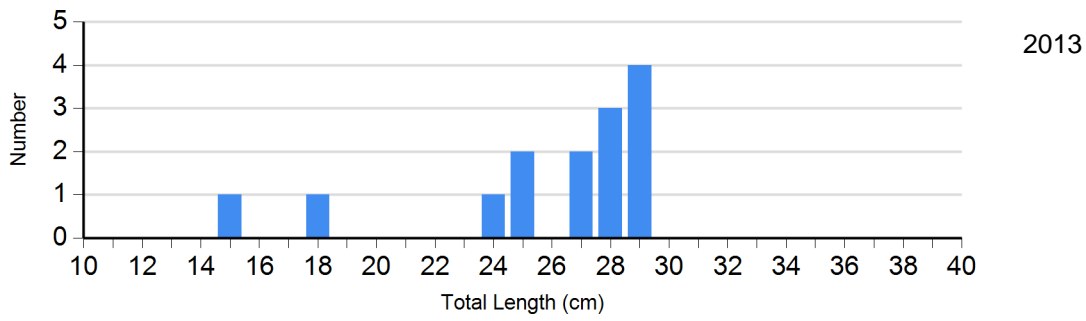
Species: Walleye  
Gear: std exp gill net



Species: Yellow Perch  
Gear: AFS std gill net



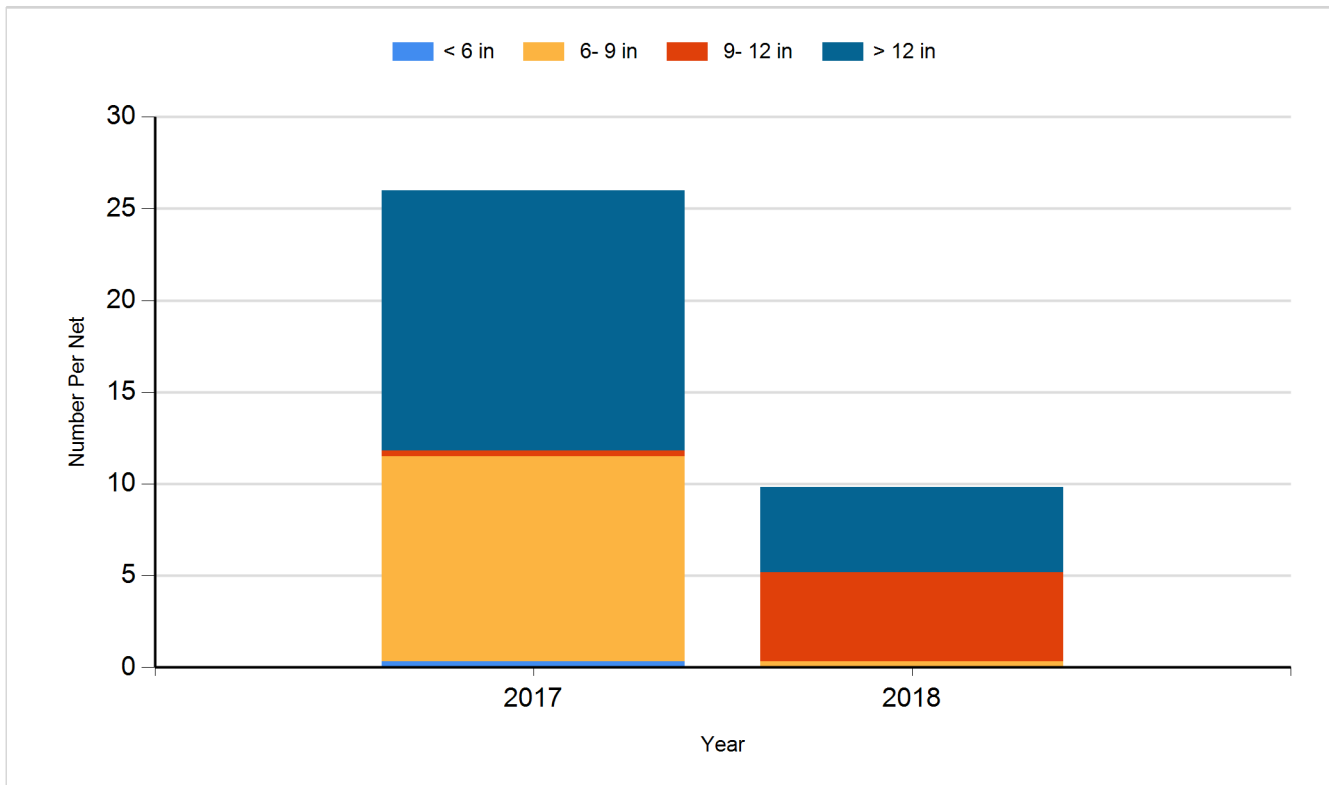
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Gear: std exp gill net



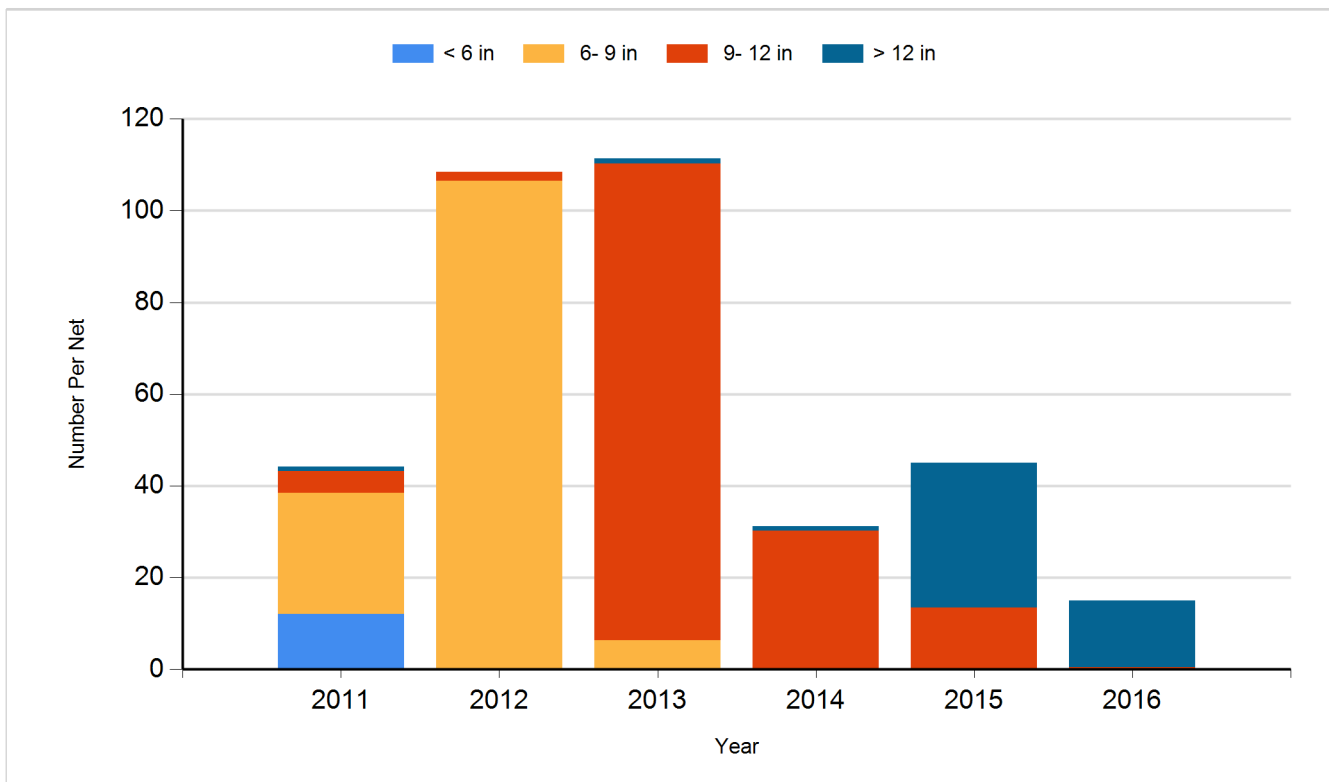
## Historic Fish Sizes and Relative Abundance

Size distribution per net by color for species sampled by year.

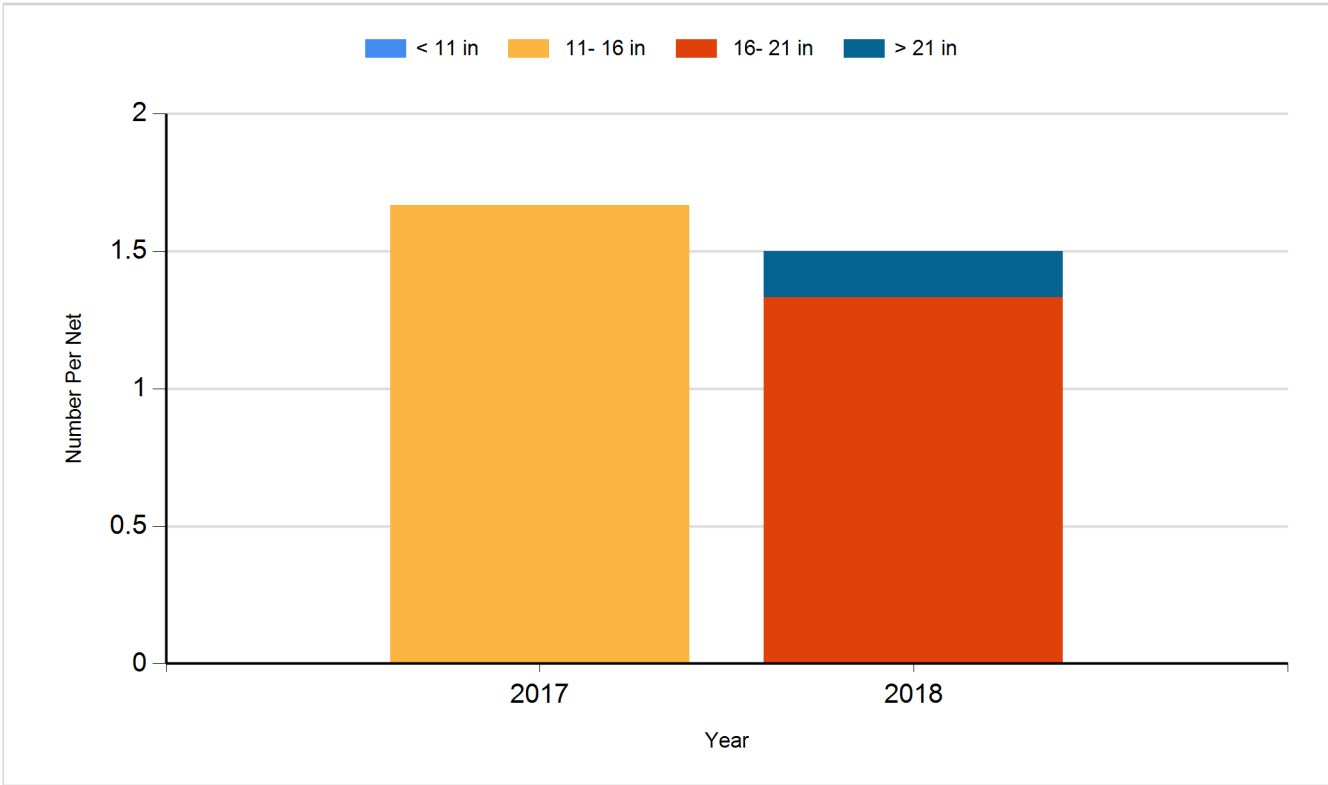
Species: Black Bullhead  
Gear: AFS std gill net



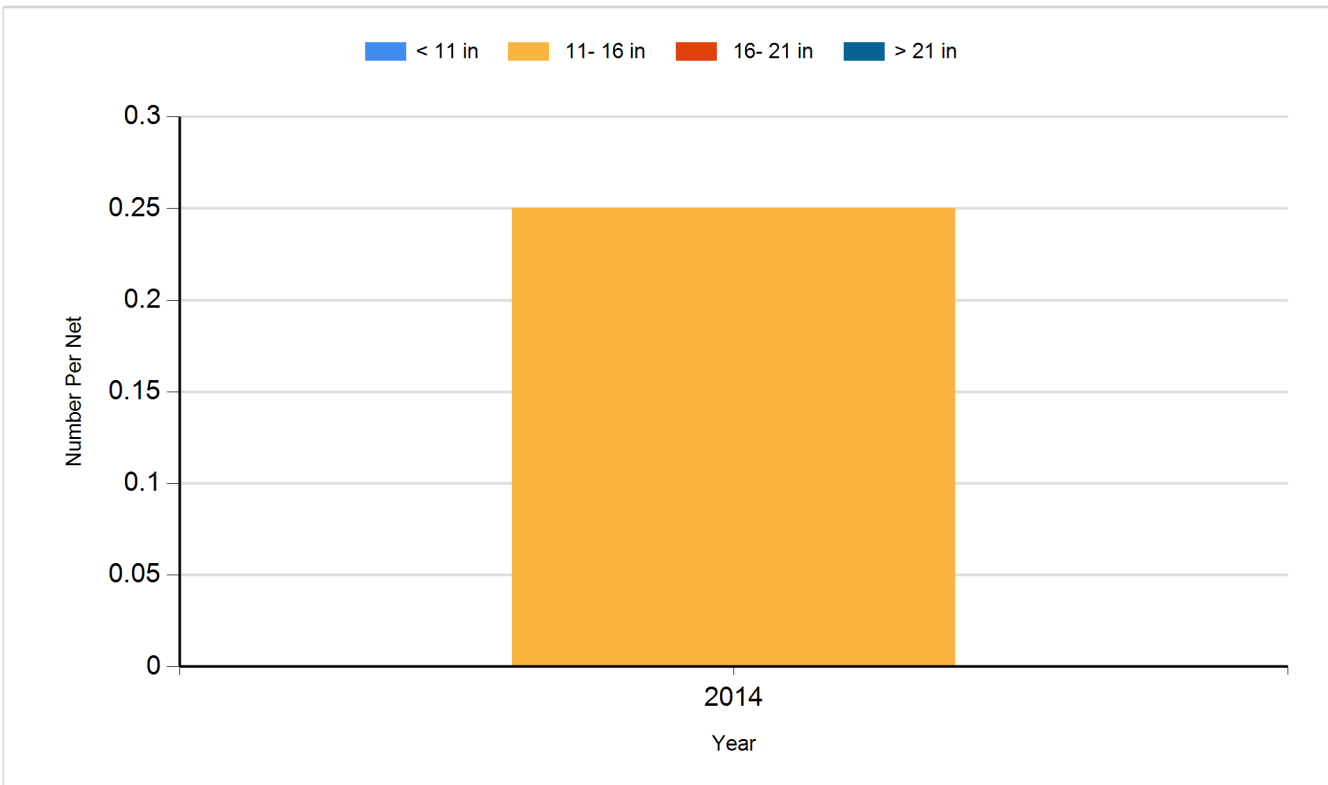
Species: Black Bullhead  
Gear: std exp gill net



Species: Common Carp  
Gear: AFS std gill net

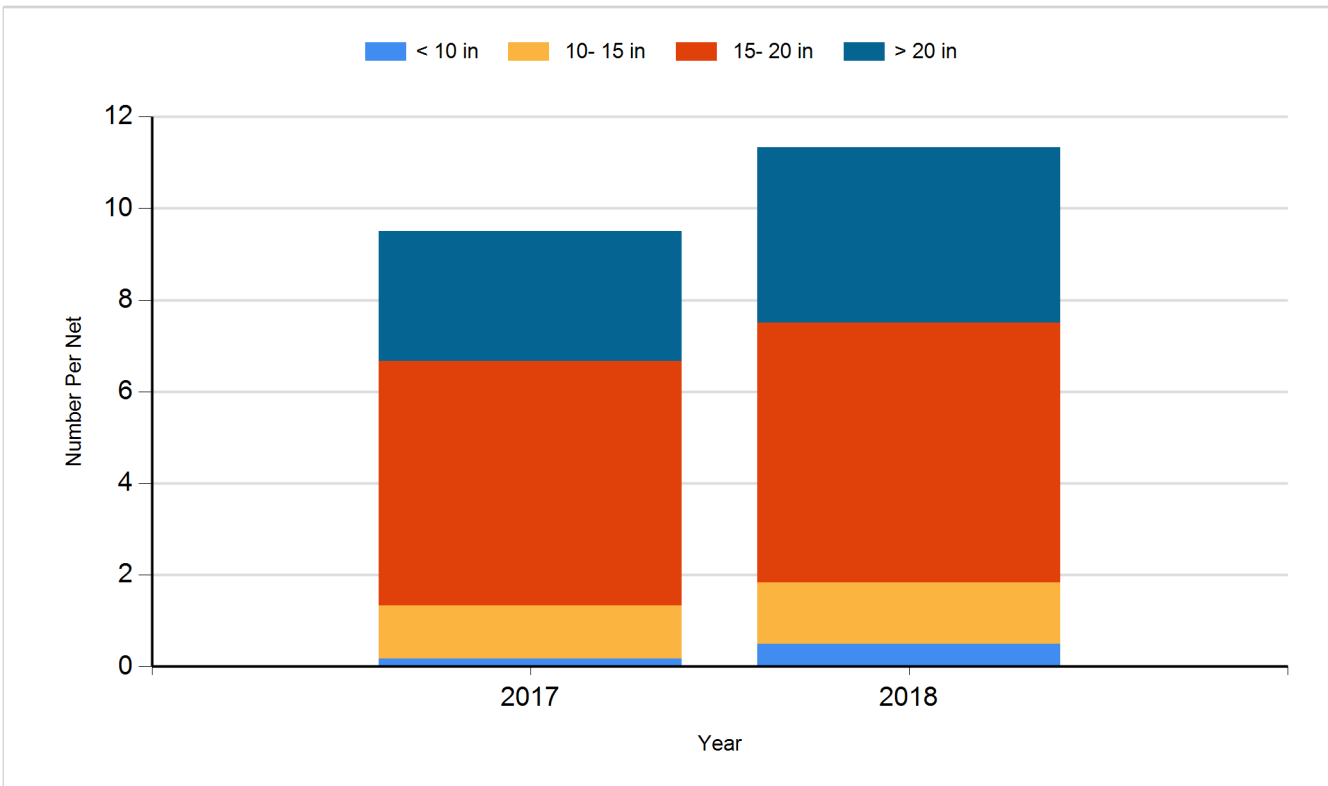


Species: Common Carp  
Gear: std exp gill net

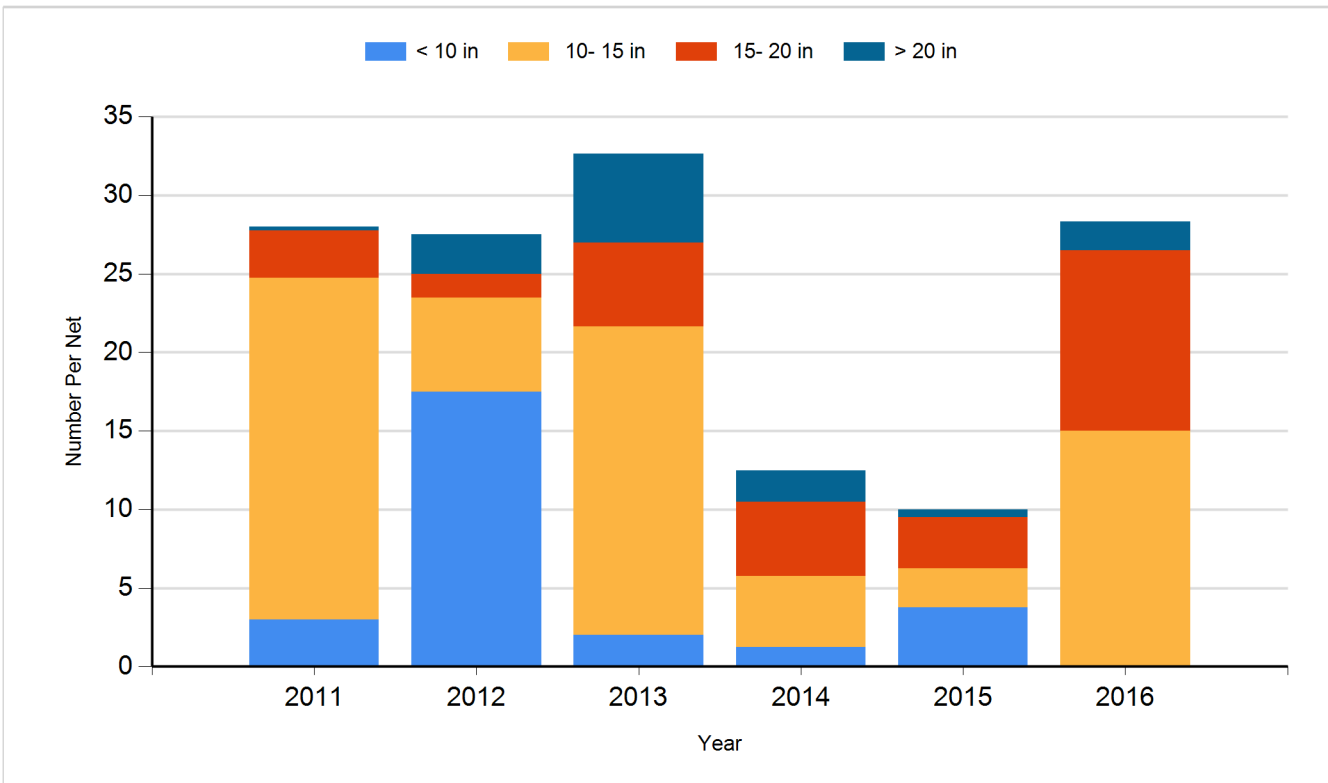




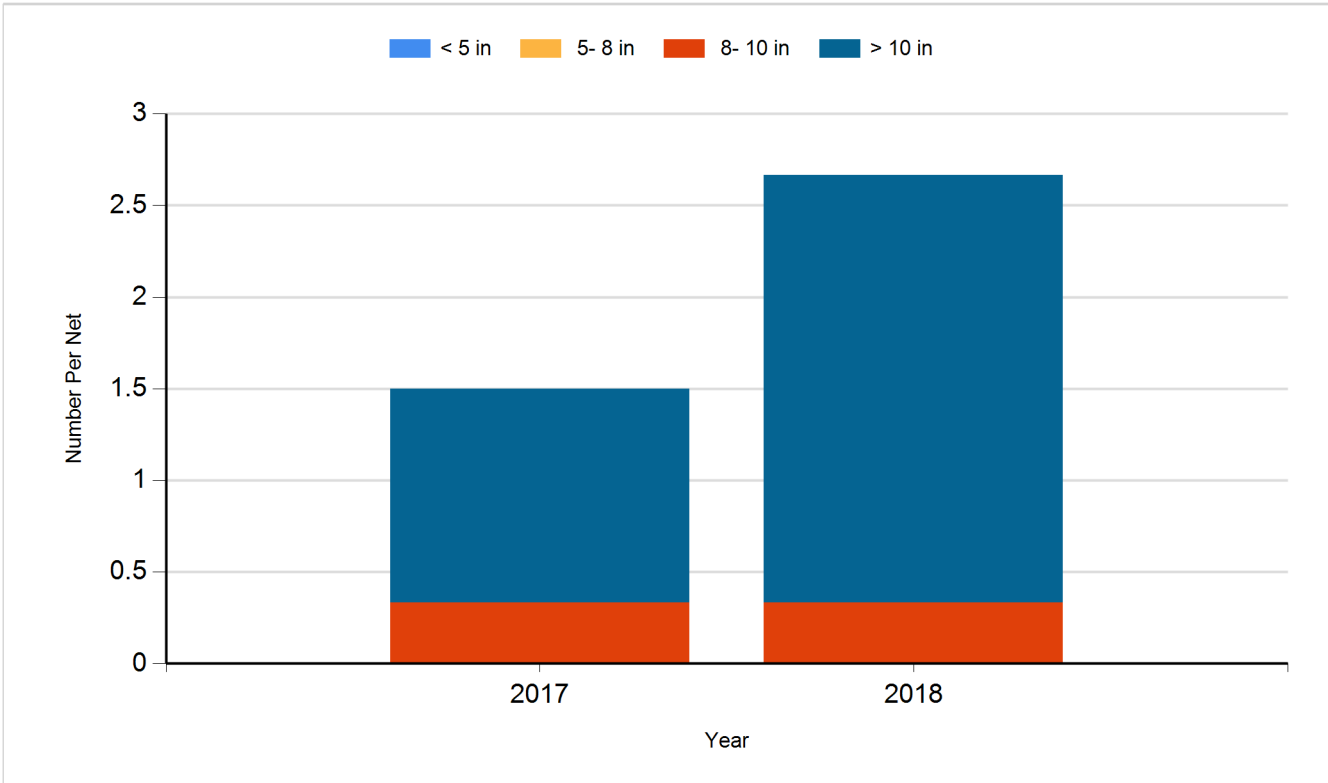
Species: Walleye  
Gear: AFS std gill net



Species: Walleye  
Gear: std exp gill net



Species: Yellow Perch  
Gear: AFS std gill net



Species: Yellow Perch  
Gear: std exp gill net

